NORTHUMBERLAND & DURHAM

MEDICAL SOCIETY.

JANUARY 15, 1885.

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NORTHUMBERLAND AND DURHAM MEDICAL SOCIETY.

The Fourth Monthly Meeting was held in the Library of the Newcastle-on-Tyne Infirmary, on Thursday, January 15th, 1885—the President (Dr. Fielden) in the chair.

The following gentlemen were elected members of the Society:—

H. M. Hardcastle, M.B. C.M. Edin., New Bridge Street, Newcastle.

James D. Farquharson, M.B. C.M. Edin., Westgate Road, Newcastle.

DISCUSSION ON THE PREVALENT DISEASES OF THE DISTRICT.

Mr. Henry E. Armstrong presented the following:—

Return of Admissions to and Deaths at the Newcastle Fever and Smallpox Hospitals during the month of December, 1884.

Disease.	Admissions.	Deaths.
Small-pox	5	0
Enteric Fever	3	1
Scarlet „	2	0
Total	10	1

Dr. Arnison remarked that he was attending a case of typhoid fever in which defervescence occurred on the 13th day of the disease. The patient had suffered from diarrhœa and hæmorrhage from the bowels. The only explanation he had to offer of this early recovery was a previous attack upwards of 30 years ago. He asked whether any of the members had met with similar cases.

Dr. Philipson reported the occurrence of cases of enteric fever, of an unusual type, in which constipation was a prominent symptom; also of cases, attended with excitement, maniacal in character, or violent delirium. He stated that, in Quain's Dictionary of Medicine, a type of enteric fever with constipation was described, also one with meningitis. The form with constipation was peculiar, in that the constipation was persistent throughout, and not merely lasting for a few days, and then giving place to diarrhœa. In both varieties, the eruption was characteristic and

copious, and the elevation of temperature was distinctive. If care had not been exercised in the diagnosis, the cases might have been taken for typhus fever.—In answer to Dr. Arnison, he said that the cases with violent delirium from the first were very severe, and that for some days the patients were in a most dangerous condition.

Dr. Philipson also reported the admission of two cases of true scorbutus into the Newcastle Infirmary under his care, within a few days of each other, in December, 1884. Both men had been resident in Gateshead, and had been earning their livelihood as labourers, but for some months had been little employed. They had subsisted on tea and crusts of bread. For months they had not tasted animal food or vegetables. The cases were characterised by intense general debility, sponginess and swelling of the gums, ecchymosis about the thighs and legs, hæmorrhages from the mucous surfaces, and great dyspnœa. The patients were placed on the ordinary meat diet of the hospital, and lemon juice was administered in half-ounce doses every three hours, and a rapid improvement soon followed. Dr. Philipson was of opinion that this occurrence of scorbutus, when considered in relation to the present non-existence of typhus fever in Newcastle and Gateshead was of great interest. It was to be regarded as evidence that there was no overcrowding amongst the poor; for, if overcrowding and underfeeding had been co-existent, it was highly probable that typhus fever would be prevalent.

Dr. Arnison asked if the type of fever was severe, as the most rapidly fatal cases he ever saw were attended with constipation.

Dr. Philipson, in reply, said that the cases had all been severe, and the onset sudden.

Dr. Herbert Bramwell referred to a case of scurvy in a woman who lived upon bread and tea. In the course of an hour her skin became covered with hæmorrhages, which extended to the larynx; large ulcers formed on the legs. The case did well on lime juice.

PATHOLOGICAL TRAY.

STRANGE MATERIAL SAID TO HAVE BEEN PASSED PER VAGINAM.

Dr. J. D. Dixon showed some curious masses resembling sausage meat, and said: A young woman, A.V., aged 23, single, who is at present under my care, states that these substances are passed from her vagina. This has been going on for the last eighteen months. At first, the substances were irregular in shape, but when I first saw her, about a year ago, they were about the size of a walnut; all of the same size, and having the appearance of being moulded. She stated that about one hour before

passing one, she always felt a pain in her left iliac region, which gradually travelled down to the vagina, and then the substance dropped out. This was followed by a gush of blood. Her mother corroborated all her statements, and said that the process just resembled a miscarriage. At that time she was passing one of these bodies nearly every third day. In the course of a few months she began to pass them less frequently, but much larger in size, until she produced a specimen weighing 1 lb. 4 oz. Since then, they have begun to slightly decrease in size, and the latest peculiarity is, that they have some stringy material hanging at one end, which the patient's mother says is attached somewhere within the vagina, and has to be broken through before the substance can be removed. The uterus is fairly normal in condition, certainly bearing no appearance of such bodies having come from within it. A.V. is very hysterical.

HERNIAL SAC, FROM CASE OPERATED ON FOR RADICAL CURE.

Dr. MORISON said: The first specimen I have to shew is the sac of a femoral hernia, with piece of omentum, removed from a woman 34 years of age. Before operation, the diagnosis was uncertain from the history of the tumour and from its varying condition on different occasions of examining it. The history was as follows: some swelling had existed in the femoral region for nine years, which varied in size, and was always larger, more tender, and painful during her menstrual periods. On first examining it, I found a swelling in the ordinary position of a femoral hernia, the size of an orange, tender on pressure, tense from contained fluid, not reducible in whole or in part, and with no impulse on coughing. On examining it on another occasion, I found that the fluid could be reduced with ease, but that a solid substance, which I took to be the ovary, was left, and this was irreducible. As the swelling occasioned considerable pain to the patient, and prevented her from readily performing her ordinary duties, she was anxious to have it removed. The operation was performed by making a vertical incision over the length of the tumour and opening the sac. The contained piece of omentum, which I here exhibit, was ligatured with cat-gut, and the stump returned into the abdominal cavity. The sac was now dissected out, its neck tied as high as possible with thick cat-gut, and the ligatured neck pushed with some force into the femoral ring, so that it might remain jammed there and prevent any future hernia formation. The long cat-gut ligature was left hanging out of the lower end of the wound which was stitched with cat-gut, and dressed with gauze and a pad, such as I shew you of wood wool, and this was left undisturbed for three weeks, when the wound was found to be firmly healed. It is now two months since the operation, and there is no tendency to hernia.

The second specimen I have to exhibit is a malignant tumour which commenced in the upper eyelid of a boy, five years of age. The tumour was first noticed six weeks ago as a small red spot on the upper eyelid, which, by the time I saw it, had reached the size of a Tangarine orange, and had involved the whole contents of the orbit. I removed it with the orbital contents, including the eye-ball, by a circular incision about a quarter-of-an-inch beyond the margin of the orbital cavity. It is now two months since the operation, and the wound has nearly healed, with no appearance of recurrence. Microscopically the growth (sections of which may be seen under the microscopes) is a large round celled sarcoma.

The third specimen is a portion of the liver, removed *(post mortem)* from a patient who was admitted to the hospital under my care. His history was to the effect that his illness commenced three months before with a feeling of weakness and illness which had increased as time went on, and his flesh diminished, and occasionally he had shivering attacks resembling ague. On his admission to the hospital nothing was discovered beyond a large smooth swelling, occupying nearly the whole abdominal cavity, above the umbilicus. During one of my visits, he had an attack resembling in every respect the shivering fit of ague, but not followed by any rise in temperature or sweating, and only slowly recovered from. For three days before his death there was slight jaundice, but no œdœma of legs or ascites. The *post mortem* shewed that the tumour was an immensely enlarged liver, friable and vascular. A microscopic section, which may be seen under one of the microscopes, shews it to consist almost entirely of round cells with some fibrous and much vascular tissue. As I had never before seen a liver anything like this one, I thought it might interest some of the members of the Society to bring forward this portion for inspection.

DISCUSSION ON RICKETS: ITS CAUSES, EFFECTS, AND TREATMENT.

Introduced by Dr. ARNISON, Senior Surgeon to the Newcastle-on-Tyne Infirmary.

Mr. President and Gentlemen,

Rickets is defined by Dr. Eustace Smith, in his article in Dr. Quain's Dictionary of Medicine, as "a general disease affecting the nutrition of the whole body; arresting natural growth and development; perverting and delaying ossification; retarding dentition; causing the bones to become soft and to yield to pressure, and the muscles and ligaments to waste; and in many cases producing alteration of the brain, liver, spleen, and lymphatic glands."

If that is a correct definition, you may fairly ask why choose it as the subject for surgical discussion? I reply, that the most obvious anatomical lesions of rickets are found in the parts of the body claimed by surgery, viz., the limbs, that the deformities caused by it are curable by surgical treatment, and by surgical treatment only, and that as, in consequence, it finds a proper place in surgical text books, under the head of diseases of bones, so the committee of this society may fairly claim absolution for their choice of rickets, as the subject for discussion on the evening devoted to surgery.

My subject, as laid down for me, is "Rickets: its Causes, Effects, and Treatment," but I crave permission for a brief *résumé* of its symptoms. One of the earliest and most remarkable is profuse sweating of the head, neck, and upper part of the chest, especially during sleep, while the lower parts of the body are dry and hot, leading the child to kick off the bed clothes, even during the coldest weather; further, there is a general tenderness to touch, and unwillingness to be moved, a cessation of all childish ways, langour and dulness; and now the bone lesions appear. The ends of the long bones enlarge from excessive cartilaginous growth, the flat bones become thickened, and all the bones lose their firmness and become softer, leading to the well-known deformities of the limbs and chest. The spine bends in a general backward curve, and the head sinks between the shoulders. Respiration becomes difficult, owing to the softened ribs not permitting free expansion of the chest. The bowels become disordered, with loose, offensive, and ill-digested stools. The flesh becomes soft and flabby. The liver and spleen enlarge. The belly becomes prominent. The skull elongates, and looks large out of proportion to the face—the growth of the facial bones being arrested. And in most cases, although the child acquires "old fashioned" ways and apparent precocity, it is in reality deficient in mental as in bodily power.

In considering the etiology of rickets I shall divide the causes into intrinsic and extrinsic; and I shall propose for discussion the following points, without, however, in any way wishing to confine the members to those points, if others suggest themselves to their minds. Under intrinsic causes I shall discuss the influence of heredity, of syphilis, and of scrofula; and under heredity, I shall include the influence of the general health of the parents, either with or without reference to rickets. Under extrinsic causes I shall discuss the influence of food, water, air, light, and general hygienic surroundings.

In the absence of other causes of rickets there is no proof that a rickety parent is more likely than another to procreate a rickety child, at least such is the opinion of almost all British authorities; but I ought to mention that Vogel, a German writer on the subject, is of a different opinion. He says he knows many families in which the parents showing distinct signs of having been formerly affected, the children have all become rickety in turn, in spite of every precaution. *Prima facie* it may be supposed, and experience proves it to be the case, that a parent debilitated from any cause is more likely than a healthy parent to have rickety children: as in the case of parents too young or too old, a father debilitated by syphilis or other chronic disease, by venereal excesses, or old age; or mother exhausted by frequent child-bearing or oversuckling, poor and ill-fed, or rich, it may be but anæmic. Such parents are likely to have rickety children, although some authorities, notably Sir Wm. Jenner, believes that the father has no influence whatever either for or against; that it depends on the state of the mother alone. He says:—"It is very common for the two or three first-born children to be free from any sign of rickets, and yet for every subsequent child to be rickety: again, if a woman have one rickety child, in the large majority of cases all her subsequent offspring will be rickety. The explanation of this fact is, that amongst the poor the parents are generally worse fed, worse clothed, and worse lodged, the larger the number of their children. The man's wages remain stationary, the calls on his means are increased, and among the rich and poor, the larger the number of children the more has the mother's constitutional strength been taxed, and the more likely is she to have lost general power."

Syphilis cannot be accepted as a cause of rickets, any further than by its effect on the general health of either parent or child. Either disease may exist in a marked degree without any sign of the other. Given rickets *plus* syphilis, and the probability is that a rickety child will be still more rickety. A well-known French writer, M. Parrot, has lately asserted that rickets is in *every* case simply a form of hereditary syphilis, but this statement cannot be received. Many a well-marked case of rickets is seen where the

most careful investigation fails to elicit any evidence of syphilis in either parent or child. Again, in remote country districts, where, although no claim to superior morality can be established, yet syphilis is absolutely unknown, cases of rickets, although rare, are occasionally found. And lastly, in the lower animals a disease is found which no one, so far as I know, has yet proved to differ from rickets, and in them we must, of course, exclude syphilis.

A Scottish agriculturist, writing to Dr. Crisp, says: "I have seen the rickety state you described in foals not getting sufficient milk, or if the mother was being worked. I have also seen it in lambs in hard seasons when milk is scarce. Cold aggravates it, the joints thicken and swell, and the animal dies after lingering a while; or it becomes useless." A French writer, Hurtrel d'Arhoval, in the French Dictionary of Veterinary Medicine, says: "It is less rare in calves than in the horse, especially when they have impure air and bad food. These animals eat much, have large stomachs, deformed chests, diarrhœa, slow dentition, and often die before they reach adult age."

If for "animals" we write "children," is there one word of this description that needs to be altered? But where does the syphilis come in? The disease is also found in the monkey and dog.

As regards the influence of scrofula there is much difference of opinion; and in discussing this point, I think a clear idea of what is meant by the term should be kept before the mind. By scrofula, I mean a tendency to tubercular deposit, and enlargement and caseation of lymphatic glands, and I would agree with those who regard scrofula as identical with tuberculosis. English writers generally believe, and English statistics tend to show, that rickets and tuberculosis so rarely occur together that they may almost be considered incompatible with each other,—but they do undoubtedly occur together, even in England; and some German authorities attach great importance to the influence of the tubercular state in the parent. Ritter von Rittersheim thinks that he has traced rickets to the presence of tuberculous disease in the father more frequently than in the mother; but that may have been due simply to the father's ill-health, amongst the poor, causing the mother and children to suffer privation in different forms.

I now come to the extrinsic causes, and of these, food stands first in importance, for of all the factors that I have named, diet is the only one between which and rickets the relationship has been found to be so constant, that it may be considered as essentially a dietetic disease. No one here requires to be told how the ignorant poor feed their infants. Sir Wm. Jenner's description of the mode of rearing children in London, which he gives in those famous lectures published in 1860, will apply to any town in the kingdom. "For the first two or three days," he says, "their tender stomachs

are deranged by brown sugar and butter, castor oil and dill water, gruel and starch water; as soon as the mother's milk flows, they are, when awake, kept constantly at the breast. After the first month, bread and water sweetened with brown sugar (the "boiley" of the North) is given several times a day; and during the night the child is, when not too soundly asleep, constantly at the breast. Then, instead of being weaned when from ten to twelve months old, the child is kept at the breast—when the milk is worse than useless, to the injury of the mother's health and the damage of its after brothers and sisters, in the hopes that thus keeping it at the breast may retard the next pregnancy." In many cases that have been observed, the first onset of the disease and its degree of severity were found to be distinctly related to the period at which starch feeding was begun. In towns where women are largely employed in factories, their babies are put out in charge of some old woman during the working hours, after the first few weeks of life, and starch in some form constitutes the greater part of their food. It may, I think, be considered proved that improper feeding is the chief element in producing rickets. Starchy food in place of the mother's milk, or suckling continued long after the milk has ceased to furnish all the elements necessary; to this may doubtless be added the dosing with gin and cordials, so common amongst the ignorant poor. I have already referred to rickets in the lower animals arising from natural causes, and it is well known that a disease, certainly very like rickets, has been produced in dogs by keeping them on improper food.

No appreciable influence in the causation of rickets can be assigned to the water supply. It has been thought that water deficient in lime salts was a cause of rickets, but the disease is at least as common in London, where the water is hard, as it is in Glasgow, where it contains only a trace of lime. Much more weighty is believed to be the effect of insufficient light and air, of damp dwellings, and bad hygienic surroundings. Indeed, the German writer Vogel almost ignores the influence of food, and insists on want of fresh air as the most important factor in the etiology of the disease. We know how many of the poor live in damp dwellings, even in cellars, where daylight cannot penetrate and gas is burnt all day long. Their bedding is scanty, and has to be eked out with their wearing apparel, such as it is. They huddle together for warmth, and shut up every crevice to exclude the cold air, and it is amongst such that rickets is most commonly found.

Dr. Crisp has put on record a remarkable case in his own experience of a family that he knew. He "had known the parents, both healthy, for many years. The father, a well-to-do cheesemonger and poulterer, took a large shop in London, hi

children at this time being in tolerable health. The sitting-room, where the children were generally kept, was behind the shop, and the room six feet above the level of the shop floor. About a dozen gas lights supplied the shop, and the atmosphere of the room above was fulsome and oppressive for several hours of the day. In the course of two or three years, one of the children died of tubercular peritonitis, another of brain tubercle and chronic hydrocephalus, as verified in each case by *post mortem* examination, and a third and younger child, at an early age, had rickets in its severest form, but removal to the country probably saved her life, although she is now very delicate and much deformed. In these examples there was no stint as regards food. The children, as in many instances of rickets, were over-fed." Even where the diet is improper a fine bracing air will do much to counteract its ill effects, and this may in some degree explain the rarity of rickets in country districts; but when the young mammal, almost from its entrance into life, is fed on starch, condemned to live in semi-darkness, and to breath a pestiferous atmosphere, can one wonder that it should develop rickets.

With regard to the second part of my subject, I propose to discuss the effects of rickets, first, as tending to destroy life, and next, its effects on the skeleton when the patient survives.

Rickets may destroy life, but very rarely, by intensity of the general cachexia, before visceral or skeleton changes have time to show themselves. The most common cause of death is catarrh and bronchitis. The softening of the ribs renders the mechanical power by which inspiration is performed so defective, that air cannot get past the mucus blocking the tubes, and so collapse of large portions of the lungs follows; so that in bronchitis in a rickety child, the danger is in proportion to the softening of the ribs, fully as much as in proportion to the severity of the bronchitis. In all such cases, it is necessary to strip the child, and note the amount of softening of the ribs, and the extent to which they recede in inspiration and are forced out in expiration, quite as much as to note the lividity of the lips and other signs of impeded respiration.

Albuminoid infiltration of the lymphatic glands, spleen, and other organs is not an uncommon cause of death. This condition during life is shown by great and progressive emaciation and pallor, sometimes there is anasarca. The enlarged spleen and liver can often be made out during life, and it has been noted that where the viscera are very markedly affected, the skeleton to a great extent escapes. The lymphatic glands are never very large; they may be from a large pin head to a large pea, and may be felt in the groins, axilla, and neck; they are not tender, and rarely inflame.

Laryngismus stridulus is another cause of death, and its connection with rickets is so close, that Sir Wm. Jenner, in 1860, among the numerous cases of laryngismus he had seen, had met with only two where the child was not rickety. Death may also arise from chronic hydrocephalus, convulsions, or persistent diarrhœa.

The effects of rickets on the skeleton are many and important. In women as they effect parturition, and in both sexes from the deformities, inconvenience, or absolute disablement, which result. Enlargement of the growing ends of the long bones is best seen in bones thinly covered by soft parts, such as in the wrist and ankle, but it is found in the ends of all the long bones: and in the ribs, this thickening at the junction of ribs and cartilage causes the peculiar projections under the skin like a row of beads. This enlargement arises from excessive formation of cartilage, while at the same time there is retardation and incomplete performance of the process of ossification. The flat bones, such as the scapula and skull bones, become thickened; the thickening is usually greatest at the growing margin, as near the sutures in the skull. Softening of all the bones, even of those which have undergone considerable ossification. Bones effected in rickets yield little or no gelatine on boiling, and much less than the normal proportion of inorganic matter, so that after emaciation they are remarkably light and porous.

As the result of this softening of bones numerous deformities arise.

The spine is bent, the cervical anterior curve being increased, and the face is directed upwards whilst the head falls backwards. Below the neck there is often a long posterior curve, involving dorsal and lumbar spine, that may easily be mistaken for angular curvature.

The femur is curved forwards and outwards, and according to Sir Wm. Jenner this curve is caused by the weight of the legs, as they hang over the nurse's knee when the child sits on her lap. The curve being once established is increased when the child begins to walk.

When the tibia curves before the child gets on its feet, the curvature is almost always outwards—an exaggeration only of the normal curve in a young child, and is produced by the child sitting somewhat cross-legged, and bearing on the floor or bed with the outer malleolus. After walking, the weight of the trunk is the chief agent in determining the bending of the tibia. The bones of the forearm are bent by the child being unable to support itself in a sitting posture, owing to muscular weakness, and, therefore, throwing part of its weight on to its arms.

The humerus is bent sometimes at an angle just at the insertion

of the deltoid. This curve is set up by the weight of the arm, when the limb is raised by the deltoid, and is increased by the same causes as determine the bending of the forearm.

The clavicles are often the seat of extreme angular curvature, one bend being just outside the insertion of the sterno-mastoid, the other about half-an-inch from the scapular articulation. The first curve is forwards and upwards, the second backwards. The curves are produced partly by the weight of the arm on the humeral end of the clavicle, while the sternal end is supported by its ligaments and muscles, but chiefly by the force acting upon it when the weight of the trunk is thrown on to the upper extremities, as the child crawls, or sits supporting the upper part of the body with his hands.

The deformity of most interest to the physician is that of the chest. The back is flattened, the ribs have their angle abnormally acute, and from it they pass forwards and inwards to join the cartilages, and from the junction the cartilages curve outwards first before turning inwards to the sternum. The result is that the sternum projects in the form known as pigeon breast, and on each side is a groove, or furrow, extending from the first to the ninth or tenth rib, but deepest at the fifth, sixth, and seventh. A little below the nipple the chest walls expand considerably, being borne out by the liver, stomach, and spleen. The cause of this grooving is atmospheric pressure. The diaphragm acting energetically, the softened ribs yield at each inspiration, and the result is recession of the chest wall at the junction of ribs and cartilages, and the groove, or furrow, that I have mentioned. Just in proportion as the ends of the ribs are forced inwards the sternum is carried forwards, and the result is the pigeon breast, more or less strongly marked.

The deformity of most interest to the obstetrician is that of the pelvis, the form of which will vary, first, according to the direction in which it is compressed by the spine on one side, and the heads of the thigh bones on the other, and such direction will vary according as the child is the greater part of its time lying, sitting, crawling on all fours, or walking; and secondly, according to the age at which the compressing forces are brought to bear upon the walls of the pelvis, and the consequent stage of ossification the bones have reached.

I have, lastly, to refer to the effects of rickets on the head, of which the antero-posterior diameter is increased. The bones are thickened, especially just outside the sutures, and the forehead is high, square, and projecting. The anterior fontanelle often remains open till after the second year. Partly as a result of this shape of the forehead, and partly from arrest of growth in the facial bones, the face looks disproportionately small.

Arrest of growth in bones is another important consequence of

rickets. It begins during the progress of rickets, but goes on after the general disease has terminated. Hence the subjects of it are stunted in growth as children, and never grow into ordinary sized adults. The lower limbs are especially disproportioned in size. Delay in dentition is such a marked symptom of rickets, that suspicion of its presence should be roused if no teeth appear at the end of nine months.

The treatment of rickets naturally divides itself into the medical treatment of the constitutional disease, and the surgical treatment of the deformities. From what I have said of the causes it will be inferred that the first part must be largely hygienic. Free ventilation, plenty of light and fresh air, a dry situation, daily bathing the whole body in tepid water, and removal when possible to the country or seaside; a dry bracing district in summer, a milder district in winter. If at the breast, the infant had probably better be weaned. If under eight months old, its food should be milk, diluted with a fourth part of lime water, and with two or three teaspoonfuls of cream added to a pint. If sugar is added, it is believed that sugar of milk is best. At about ten months old a little starch may be added, in the form of baked flour, or plain biscuit, or Rigby's, or Savory and Moore's, food. The child should be fed at regular intervals, and not allowed at the breast between times, and it is better to feed it with a spoon out of a cup than out of a bottle, so as to avoid risk of want of cleanliness and fermentation of the food. After about a year old, a little beef tea may be given, or eggs, or small quantities of meat, which should be well pounded in a mortar; and potatoes should likewise be carefully mashed. The secretions should be carefully attended to; mild alkaline purgatives, may be given or an occasional dose of grey powder and jalap or rhubarb. Some ferruginous tonic should be given, and there is none better than steel wine, with which small doses of quinine may be combined, or the syrup of the superphosphates, known as Parrish's chemical food. Cod liver oil is most valuable, some continental authorities, in fact, consider it a specific; and Trousseau advises that it should be the unrefined dark oil. The child, while taken out of doors a great part of the day, should be kept off its feet; for this purpose, the ordinary double splint with cross bar may be applied, or splints reaching beyond the feet.

With care in the early stage of rickets, deformity may be prevented to a great extent. What the surgeon is called upon to deal with is the condition of knock-knee or bow legs, arising from the curvatures of femur and tibia to which I have referred. Before the bones become consolidated, these curvatures may generally be removed by the application of splints, in fact in mild cases they often disappear without any treatment. The splints should be applied to the concavity of the limb—to the outer side in knock-

knees to the inner side in bow leg, and may be removed at night. Marsh, of St. Bartholomew's, advocates forcible straightening of the bent bones under chloroform. This plan seems to me a good one; the bone may break in the attempt, but the fracture is simple and not compound, as in osteotomy, and unites very readily. When the child is strong enough to carry them, some form of leg-iron may be used, but when a child is too weak to bear itself up it is folly to load it with irons.

As regards osteotomy, I am inclined to think we are sometimes too ready to use the chisel. It saves time, no doubt, and the result seems brilliant from its very rapidity, but it should be reserved for cases where ossification is so far complete, as to render cure by apparatus either impossible or requiring too long a time. For example, I know of a case of aggravated knock-knee in a young man, which has been cured by apparatus at the London Orthopædic Hospital, but then the cure occupied two years, whereas osteotomy will give as good results in two months. It may also, I think, be justified in some rare cases in young children, where the deformity is so great as to cause very serious inconvenience, and in them much care is required, lest the soft bones should again bend, and deformity return. In such a case, lately under my own care, the after treatment was tedious to a degree, for what I am almost justified in calling spontaneous fracture through the epiphyseal line of both tibiæ took place; the knock-knee was cured, but the after difficulties of the case were so great that I should be very unwilling to operate again on a child so young.

Dr. Philipson heartily congratulated Dr. Arnison upon the able and instructive manner in which he introduced the subject of discussion. He agreed with him in many points, but he felt that he must express an adverse opinion on some. The first was in respect of the definition of the condition quoted from Quain's Dictionary of Medicine, and due to his friend Dr. Eustace Smith, Physician to the Children's Hospital, London. He was in favour of the definition contained in the nomenclature of diseases of the Royal College of Physicians of London, viz., that "Rickets was a constitutional disease of early childhood, manifested by curvature of the shafts of the long bones, and enlargement of their cancellous extremities." He considered that this was more simple and quite as comprehensive as the other. He did not agree with Dr. Arnison that syphilis was a factor in the causation of rickets. He believed that rickets was a purely diathetic condition, distinct from, different to, and repulsive of other diathetic conditions. He was of opinion that there were four chief diathetic conditions, viz., scrofulosis, tuberculosis, syphilis, and rachitis or rickets. Respecting the anatomical characters, he was of opinion that the actual changes in the bones consisted of proliferation of the cartilage of the epiphysis and of

the periosteum, which were the sources of the normal growth in length and thickness of the bones. He believed that the cartilaginous and fibrous tissues, resulting from this proliferation, ossified more incompletely and later than in the normal growth of bone. The excessive proliferation was to be regarded as inflammatory. The great vascularity and infiltration of the affected parts, the pains which accompany the disease from the first, and the exaltation of temperature, favoured this supposition. He controverted the statement that in rickets there was a morbid softening of tissues previously hard. He considered that tissues which normally became hard, from deposits of chalky salts, remained abnormally soft. This view was not in opposition to the fact that rachitic bones bent more readily than they did before the disease. The medullary cavity increased in rickets just as it did in healthy bones, but which, in the latter, the new formation of firm, bony substance at the periphery preponderated over its loss from within, so that, in spite of the latter, the strength of the bone increased; in rachitic bones the loss of firm, bony substance from within was not replaced by a corresponding new formation at the periphery, and consequently the resisting power was decreased. He regarded rickets as a disease of childhood, and expressed doubt whether the rare cases, when the disease was said to have occurred in adults or during fœtal life, were actually rickets. His experience was that the disease was most frequently seen from the second half of the first year till the time of the second dentition. Improper nutrition was undoubtly the most frequent cause of the disease. But he had seen the condition in children of the affluent. In such, it was undoubtedly due to the breathing of impure air, or rather the re-breathing of the same air, from the infant being placed in a cot surrounded by blankets and curtains, interfering with the renewment of air. He believed that the gastric and intestinal catarrh, due to improper nutrition, greatly favoured the occurrence of the disease. In the cases of the rich, by strict attention to hygienic rules and diet, the condition was soon overcome, clearly showing that the breathing of vitiated air was an important cause in the production of the disease. He agreed with Dr. Arnison as to the medicinal treatment aud dietary form, which he had advocated, but considered that sufficient importance had not been given as to the directions necessary concerning the character of the bed, and the manner in which the child should be carried, with the object of preventing the bending of the bones of the limbs, and the production of the other osseous deformities. He considered that it was highly necessary that definite instructions should be given to the mother as to the importance of having the child placed flat on a mattress of hair, or some other firm material, without any pillow, and that when the child was moved from the bed it should be

effected on a flat basket, and when into the open-air, in a flat carriage.

Dr. Gibson said that he was unable to recognise the existence of a true inflammatory process as an essential feature of rickets; and, as a matter of course, denied the agency of such a factor in the development of the disease. Rickets really was the result of malnutrition of the sufferer's body, and was constantly associated with abnormal or imperfect digestion. While unsuitable or scanty food, or residence in damp localities, or impure air, were one or all absolutely necessary antecedents to this condition. Loss of flesh and strength and a morbid general sensibility soon shew themselves. Impairment of the digestive powers has one very remarkable result, viz., the formation of large quantities of lactic acid. This acid is readily absorbed and freely circulated. It probably acts directly upon the bony tissues, impeding their nutrition, and operating as a solvent upon the lime salts of the already-formed bone. The gradual removal of the calcareous matters necessarily follows. In reference to the objection which was raised to the lactic acid theory of the bony softening in rickets, viz., that it could not hold in the case of the child in utero, Dr. Gibson further pointed out that in this case proper bone had never been formed, and that rickets demanded distinct bony tissue as an antecedent to the development of the affection.

Dr. Hume spoke.

Dr. Oliver said that he had not intended taking part in the discussion, seeing that it was the subject appointed by the committee for the *surgical evening*, but as the President had kindly asked him, he would say just a few words bearing upon the etiology and treatment of rickets. With the remarks which have just fallen from Dr. Hume, he quite agreed. No one believed that rickets was an inflammation of an ordinary character. As Dr. Hume had explained, the point which ruled our opinion as to whether there was inflammation in an internal organ was not the presence of the cardinal signs, *pain*, *heat*, *redness*, *and swelling*, but whether there was or was not marked cellular proliferation and the other indications of disturbed nutrition of a part. And it was here he would remark that he accepted Virchow's theory of inflammation, viz., increased activity amongst the cells of tissues, whereby they attract more nourishment, and thus grow and multiply very rapidly. Of the various causes which had been enumerated by Dr. Arnison, he believed both with Dr. Philipson and Dr. Hume that the repeated breathing of vitiated air was the most potent cause of rickets. Though willing to admit that there is very much that is true in what Dr. Gibson has said as to the evil effects of the imperfect feeding of children, he could only regard that as the stimulus to

the development of the rickety condition which, once initiated, is powerfully aided by the breathing of unwholesome air. And in furtherance of what Dr. Hume has said, as to the experience of Dr. MacEwen, of Glasgow, he would add what he had seen amongst children there. Rickets, very prevalent amongst the children in Glasgow, is absent, it is supposed, amongst those who are born and bred in the Western Highlands. It could not be that the children resident in the islands of Scotland were better fed than those in Glasgow. If anything, they were more coarsely fed, but as infants they were in all probability brought up more at the breast, and were not hand-fed. Oatmeal enters largely into their food; and in addition, they breathe the purest of air. And so it was, that owing to the population of the Highlands becoming every day more scanty, through many noblemen reducing the number of retainers and workmen on their estates, large numbers of Highlanders, with their families, made their way to Glasgow. These, while the husbands were employed in work which lead them less into the open air than formerly, their wives and children were cooped up day after day and week after week in one room; or at the most, one room and kitchen—the latter of which (as any of those here who knew Glasgow can testify to, Glasgow being built in tenement blocks and squares) looked to the back upon a divided common court, through which very little fresh air passed. Confined as these children are from week to week in one common room to which no pure air ever entered, for when the main door of the house was open it could only admit air from a common staircase and close. The children of these Highlanders, which were born in Glasgow, not frequently suffer from rickets, and stand out prominently as interesting morbid specimens compared to their older brothers and sisters, whose birth was surrounded by more healthy circumstances. With these sickly children, however, it was astonishing what effects followed removal to the sea-side. And what was seen in a general way with them, was seen in individual cases, when rickety children were taken out of doors and had their nurseries freely ventilated. He attached, therefore, most importance to bad air as the cause of rickets; believing, however, that in the earlier days of infantile life, ill-selected food may initiate the morbid conditions. So far as the medicinal part of treatment was concerned, his experience lead him to believe that the internal administration of iron with or without cod liver oil gave the best results.

Dr. Arnison replied.

RESULTS OF AMPUTATIONS TREATED ANTISEPTICALLY IN THE NEWCASTLE INFIRMARY, DURING THE YEAR 1884.

By FREDERICK PAGE, Surgeon to the Newcastle-upon-Tyne Infirmary.

I have very great satisfaction, sir, in bringing under the notice of the Northumberland and Durham Medical Society the results of amputations performed in the Newcastle-upon-Tyne Infirmary during the year 1884, and I am sure all who take an interest in the success of this institution will be glad to learn they are even better than those I had the good fortune to be able to record last year.

We have had 57 major amputations, 9 more than last year, with only 3 deaths (5·2 per cent.), and 59 minor amputations without a death—in all 116 amputations with 3 deaths. Last year we had 48 major amputations with 3 deaths (6·7 per cent.). That is to say, during the years (1883-84) 105 major amputations have been performed by four surgeons in the Newcastle Infirmary, and only six patients have died (5·7 per cent.). The following table details the nature and the results of major amputations performed during the year 1884:—

Table of Amputations performed Antiseptically during the Year 1884 in the Newcastle-upon-Tyne Infirmary.

	FOR INJURY.			FOR DISEASE.			TOTAL
	No.	Cured.	Died.	No.	Cured.	Died.	
Hip Joint	0	0	0	2	2	0	2
Thigh	2	1	1	13	12	1	15
Knee Joint	2	2	0	1	1	0	3
Leg	4	4	0	9	9	0	13
Ankle (Syme's)	3	3	0	7	7	0	10
Shoulder Joint	2	2	0	1	1	0	3
Arm	5	5	0	1	1	0	6
Fore-arm	2	1	1	2	2	0	4
Wrist	1	1	0	0	0	0	1
	21	19	2	36	35	1	57

It will be seen that 21 of the amputations were for injury, and that two patients died (9·4 per cent.); 36 were for disease, and only one patient died (2·7 per cent.). Of the two deaths following amputation for injury, one occurred a few hours after primary amputation of the thigh, from shock and loss of blood; the other was due to tetanus supervening upon a severe compound fracture of the metacarpus, for which the forearm was amputated after tetanus had set in. The single death following amputation for disease was due to recurring gangrene 48 days after amputation of the thigh for spontaneous gangrene of the foot and leg. The man was 53 years of age, and all his tissues were in an advanced stage of fatty degeneration. No death arose from any form of hospital disease, and this is the second year I have been able to make the same pregnant statement: "No death from hospital disease has followed an amputation." The following table gives the results of major amputations during the years 1883-84, bearing out what I have already mentioned: that during the two years we have had 105 major amputations with 6 deaths, or 5·7 per cent. of the 105—44 have been for injury, with 2 deaths (4·5 per cent.), a splendid result; 61 have been for disease, with 4 deaths (5·4 per cent.), which is also an extremely good percentage:—

Table of Amputations performed Antiseptically during the Years 1883-84 in the Newcastle-upon-Tyne Infirmary.

	FOR INJURY.			FOR DISEASE.			TOTAL
	No.	Cured.	Died.	No.	Cured.	Died.	
Hip Joint	0	0	0	3	2	1	3
Thigh	8	7	1	26	25	1	34
Knee Joint	3	3	0	1	1	0	4
Leg	10	10	0	16	16	0	26
Ankle (Syme's)	5	5	0	8	8	1	13
Shoulder Joint	2	2	0	2	2	0	4
Arm..	8	8	0	2	2	1	10
Fore-arm.....	5	4	1	3	3	0	8
Wrist	3	3	0	0	0	0	3
	44	42	2	61	57	4	105

During the past year 908 operations have been performed, including 11 ovariotomies, with 3 deaths; 9 lithotomies and 1 oophorectomy without a death; 24 excisions of joints, with 2 deaths; 4 colotomies, 2 gastrostomies, and 2 abdominal sections. The hospital has been seriously overcrowded, and the consequent inconvenience and discomfort have been felt alike by patients, surgeonsf and nurses. It is devoutly to be hoped before the results o-another year's amputations are laid before this Society, the move, ment now being made to build a new Infirmary on another site may have taken shape and advanced to a measureable distance of accomplishment. This venerable building is obsolete. It is nearly 150 years old, and no amount of alteration or enlargement will bring it up to the requirements of the day. Each time it has been added to the difficulties of administration have been increased, and the time has now arrived to substitute for a rambling and inconvenient old building one replete with modern appliances, compact, and situated in a quieter and more salubrious neighbourhood.

It will require a great effort, no doubt, to build another Infirmary, but the object is so good that I am sure, if the necessity of providing a new institution for the cure of the sick and lame poor of this district is once put forward as a necessity, funds will be forthcoming, and a building will be raised in everyway worthy of the stately city of Newcastle.

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